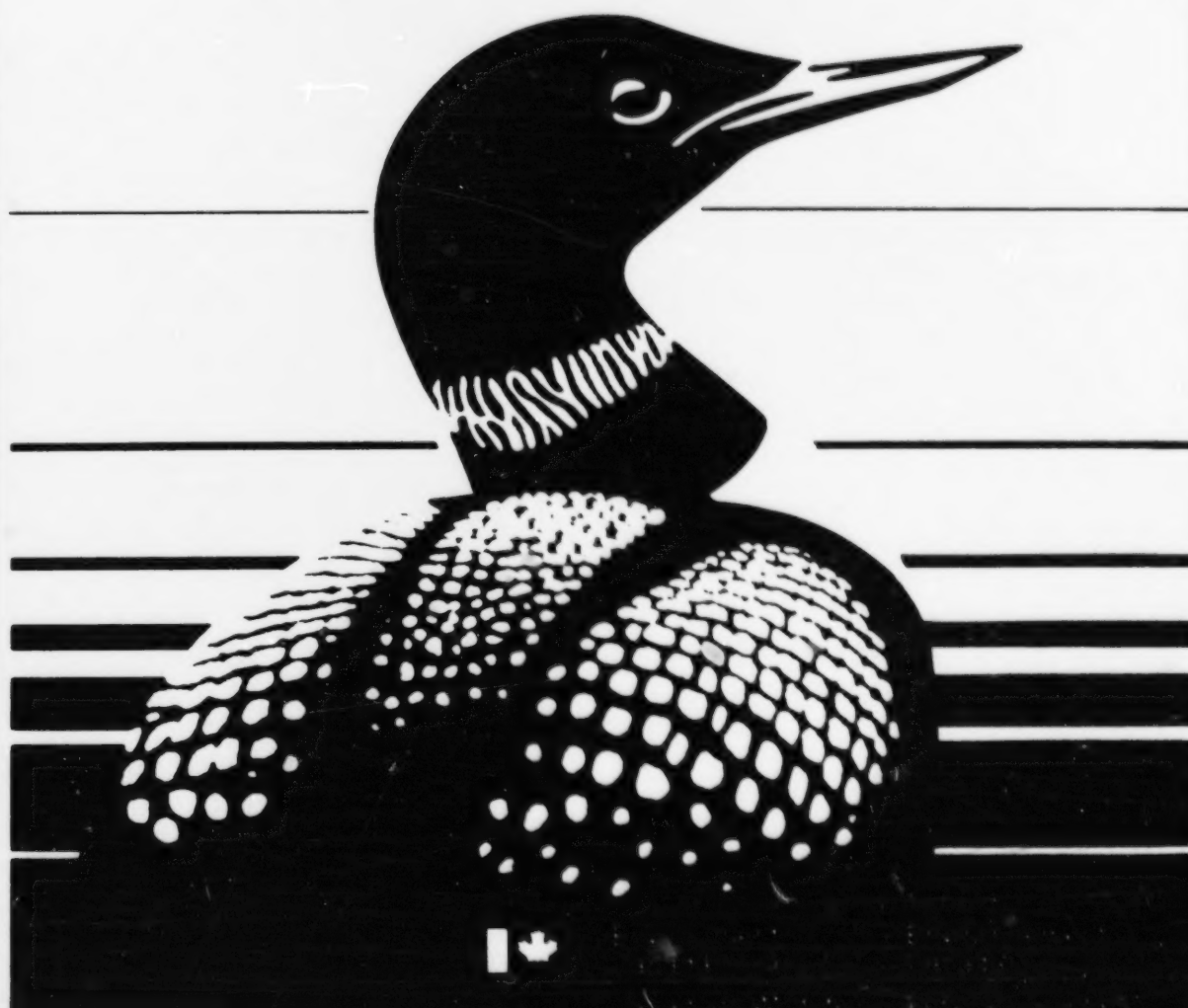


A Survey of Trumpeter Swan
Breeding Habitats in Alberta, Saskatchewan
and Northeastern British Columbia



A SURVEY OF TRUMPETER SWAN BREEDING HABITATS
IN ALBERTA, SASKATCHEWAN AND NORTHEASTERN BRITISH COLUMBIA

Habitat Conservation Section
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ABSTRACT

Trumpeter swan breeding habitat surveys were conducted in Alberta, southwestern Saskatchewan, and northeastern British Columbia between August 29 and September 20, 1985. The objectives of these surveys were: to determine distribution and location of breeding habitat, to record all wetlands used by trumpeter swans, and to determine total population size of flocks surveyed.

Surveys were flown with Cessna 182 and 185 aircraft at an approximate altitude of 250 m agl and an average speed of 200 kph. The survey crew consisted of a pilot, an observer-navigator and whenever feasible a second observer.

This study accounted for 75 pairs of trumpeter swans, 92 flocked or single birds and 130 cygnets for a total of 372 birds within the areas surveyed. The Grande Prairie flock accounted for 321 (86%) of the total count.

In order to monitor the population status of the Interior Canada subpopulations, an annual fall survey of the Grande Prairie flock is recommended. In addition, a need to document the total Canadian breeding range and the wintering grounds of these breeders in order to formulate long-term population and habitat strategies is recommended.

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1.0 INTRODUCTION

The trumpeter swan is one of few conservation success stories. Near the brink of extinction in the early 1900s, its population has made a dramatic comeback. Although still one of the rarest migratory birds breeding in Canada. To-date, minimal efforts to document its total population status and complete breeding range have been initiated.

Since the proportion of trumpeter swans known to breed in Canada is small (4.5%) relative to the total North American population, it is classified as a rare migratory bird by COSEWIC. The Migratory Birds Convention Act provides and encourage management activities to ensure maintenance and preservation of trumpeter swan habitat. This would involve the complete documentation and protection of breeding habitats in Canada and cooperative efforts with the U.S. to improve and enlarge the wintering habitats in North America.

Traditionally, it was thought that breeding habitat limited the Interior Canada subpopulation. Recent increases in the number of pioneering flocks in Canada, continuous growth of the Grande Prairie flock and winter die-offs in the Tri-state provide strong evidence that wintering habitat may be the critical factor limiting population growth. Nevertheless, as part of a management strategy, currently occupied and potentially suitable habitats in Canada need to be thoroughly delineated and assessed for carrying capacity.

The North American Management Plan for Trumpeter Swans (1984), and the Canadian Wildlife Service, draft Habitat Strategy for Trumpeter Swans (1985), both recognize as a management priority the urgent need to document the habitat use and habitat potential for trumpeter swans in the interior of Canada. Currently there is a large discrepancy between the winter population estimates for the interior Canada subpopulation and the total number of birds accounted for on the Canadian breeding areas. Approximately 500 trumpeter swans (33%) using Tri-state wintering habitats are currently unaccounted for by breeding ground population surveys. These birds are believed to originate from breeding habitat in Canada.

Population and habitat surveys coincided with similar efforts in Alaska, the Yukon, Northwest Territories, and northern British Columbia, enabling the updating of habitat use and population estimates for both the Rocky Mountain and Pacific Coast populations of trumpeter swans. The Alaska portion of this extensive survey has been conducted every five years and Canadian efforts during 1985 coincided with the Alaska survey to improve knowledge on habitat use and population of trumpeter swans in North America. These extensive detailed surveys provide a continental perspective on the status of the trumpeter swan population and its habitat.

1.1 Objectives

1. To determine the location, distribution, and use of trumpeter swan breeding habitat in Alberta, Saskatchewan and northeastern British Columbia.
2. To document all wetlands used for trumpeter swan breeding habitat and to determine total population size.
3. To provide information on habitat use and population status to provincial and local land management authorities.

2.0 METHODS

Prior to conducting surveys, a comprehensive review of existing literature, unpublished reports, previous surveys and discussions with personnel from various government agencies was undertaken. Staff from Alberta Fish and Wildlife Division, Alberta Forest Service, Saskatchewan Department of Natural Resources, British Columbia Ministry of Environment, and Canadian Wildlife Service were contacted to determine key areas of trumpeter swan breeding habitat in Alberta, Saskatchewan, and northeast British Columbia. It was determined that six separate areas of habitat had breeding trumpeter swans (Fig. 1).

Survey routes, covering as much of the known and/or suspected breeding areas of the known and/or suspected breeding

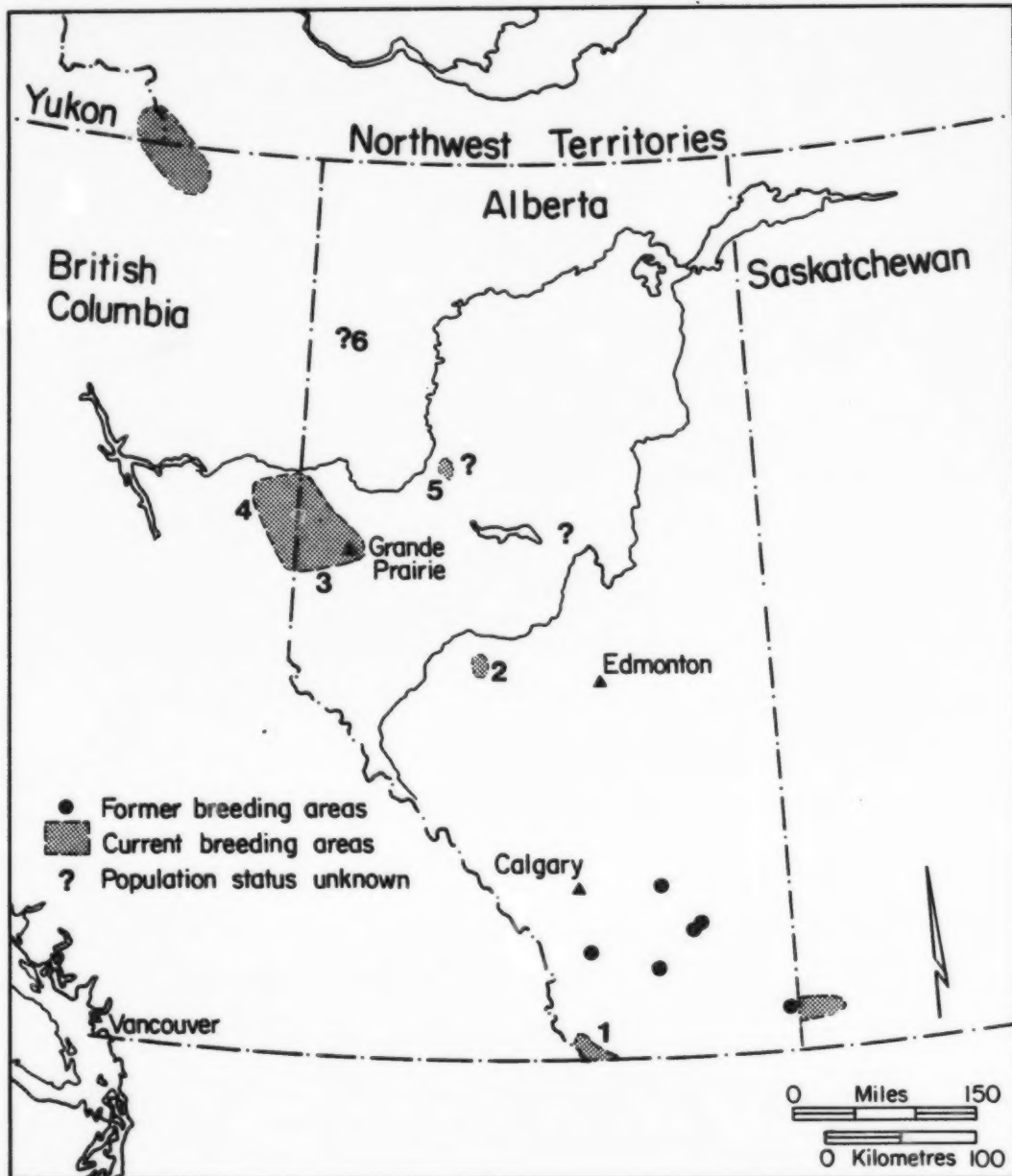


Figure 1. Location of trumpeter swan survey areas, 1985.

areas, were outlined on 1:250,000 maps. Areas surveyed and dates of surveys were:

1. Cardston/Pincher Creek.....August 29, 1985
2. Edson/Whitecourt.....September 6, 1985
3. Grande Prairie District/Alberta..September 10,11, 1985
4. Grande Prairie District/B.C.....September 11, 1985
5. Otter/Russell Lakes.....September 17, 1985
6. Chinchaga River.....September 20, 1985

Survey routes that covered as many of the known or suspected breeding wetlands within the above areas were outlined and followed (Appendix I). The Cypress Hills were not surveyed, as it was determined from (M. Killaby, pers. comm.) that only one breeding pair and three subadult trumpeter swans occurred in this area in 1984 and that ground surveys were being conducted in 1985.

All censuses were conducted using Cessna 182 or 185 fixed-wing aircraft. During each survey the aircraft was flown along a designated route at an approximate altitude of 250 m agl and an average speed of 200 kph. The survey crew consisted of a pilot, an observer-navigator, and a second observer. Both observers had maps outlining the survey route and both plotted the location and number of trumpeter swans seen. When swans were observed on a wetland, the pilot was asked to circle the wetland at a reduced speed and altitude in order to determine the exact number of swans present and flock composition.

Surveys were usually flown during the early morning or late afternoon.

3.0 RESULTS AND DISCUSSION

Survey results were summarized according to the major breeding areas surveyed and tabulated in Table 1. When a single adult with a cygnet(s) was observed, this observation was documented as a breeding pair. Appendix I provides the best indication of all the wetlands surveyed within each area. In addition, all those specific wetlands on which swans were observed, their specific location and other related information appear in Appendix II. Limitations in time and assistance precluded the collection of any quantitative habitat information.

3.1 Grande Prairie Flock

Survey coverage was increased to 1985 to include more wetlands to the south of Wapiti River along both sides of the Smoky River. Also an area to the southwest of the traditional wetlands surveyed in B.C., which included the Stoney Lake area, was added to the survey (Appendix I). Within the Grande Prairie survey area, approximately 192 different wetland areas were surveyed.

Sixty-one pairs of trumpeter swans were observed during the survey of the Grande Prairie flock (Table 1). Thirty broods

Table 1. A summary of trumpeter swan observations, fall 1985.

Survey Site	Trumpeter Swans Observed				Total
	Paired	Cygnets	Singles	Flocked	
Cardston/Pincher Creek	6	-	-	-	6
Edson/Whitecourt	14	8	1	-	23
Grande Prairie-Alberta	102	98	3	82	285
Grande Prairie-B.C.	20	16	-	-	36
Otter/Russell Lake	4	3	-	4	11
Chinchaga River	2	3	-	-	5
Total	148	128	4	86	366

totalling 114 cygnets were also censused, in addition to 85 adults and subadults in groups or as singles. A total of 321 trumpeter swans were censused. Although not directly comparable to the 1984 data, since in 1984 the B.C. segment of the survey was not completed, almost all segments of the population were lower in 1985 than in 1984 (Table 2). These lower population levels plus the 1984 death rate of 0.44 (Table 2) supports the observations of a significant trumpeter swan die-off in the Tri-state wintering area. Within the last ten years, the only time the death rate exceeded 0.33 was in 1978, when a significant die-off was recorded on the wintering grounds (Fig. 2). This 1984 die-off may have resulted in a more mature or experienced breeding flock which had excellent production in 1985. A cygnet to adult ratio of 0.55 and a mean brood size of

Table 2. Size and components of the Grande Prairie flock, 1976-1985.

Year	Total # Lakes Surveyed	Pairs With Cygnets	Pairs Without Cygnets	Total Pairs	Total Single + Flocked	Total Adults + Subadults	Total Cygnets	Total Population	Cygnets to Adults	Death Rate	Birth Rate
1976	103	14	22	36	8	80	41	121	0.51	0.27	0.34
1977	113	25	6	31	26	88	80	168	0.91	0.17	0.48
1978	153	20	19	39	61	139	72	211	0.52	0.50	0.34
1979	136	18	27	45	15	105	61	166	0.58	0.17	0.37
1980	120	23	16	39	60	138	72	210	0.52	0.20	0.34
1981	124	23	19	42	84	168	84	252	0.50	0.31	0.33
1982	131	21	17	38	97	173	67	240	0.39	0.30	0.28
1983	162	25	40	65	38	168	81	249	0.48	0.10	0.33
1984	157	37	26	63	99	225	118	343	0.52	0.44	0.34
1985	192	30	31	61	85	207	113	320	0.55		0.35
Means	139	24	22	46	67	149	79	228	0.55		

1983 component of this flock was not surveyed in 1984.

Death rate = (total population T - adult population T + 1)/total population T.

Birth rate = cygnets/total population T.

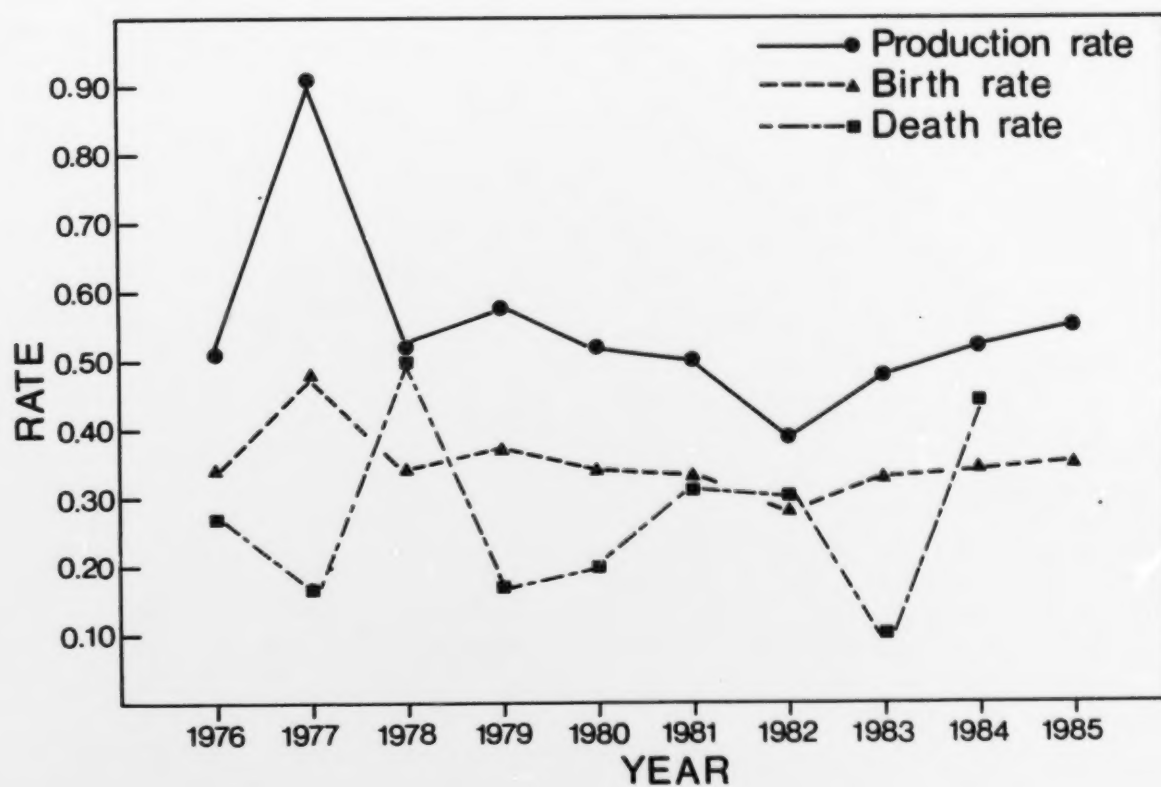


Figure 2. Birth, death and production rate - Grande Prairie trumpeter swan flock.

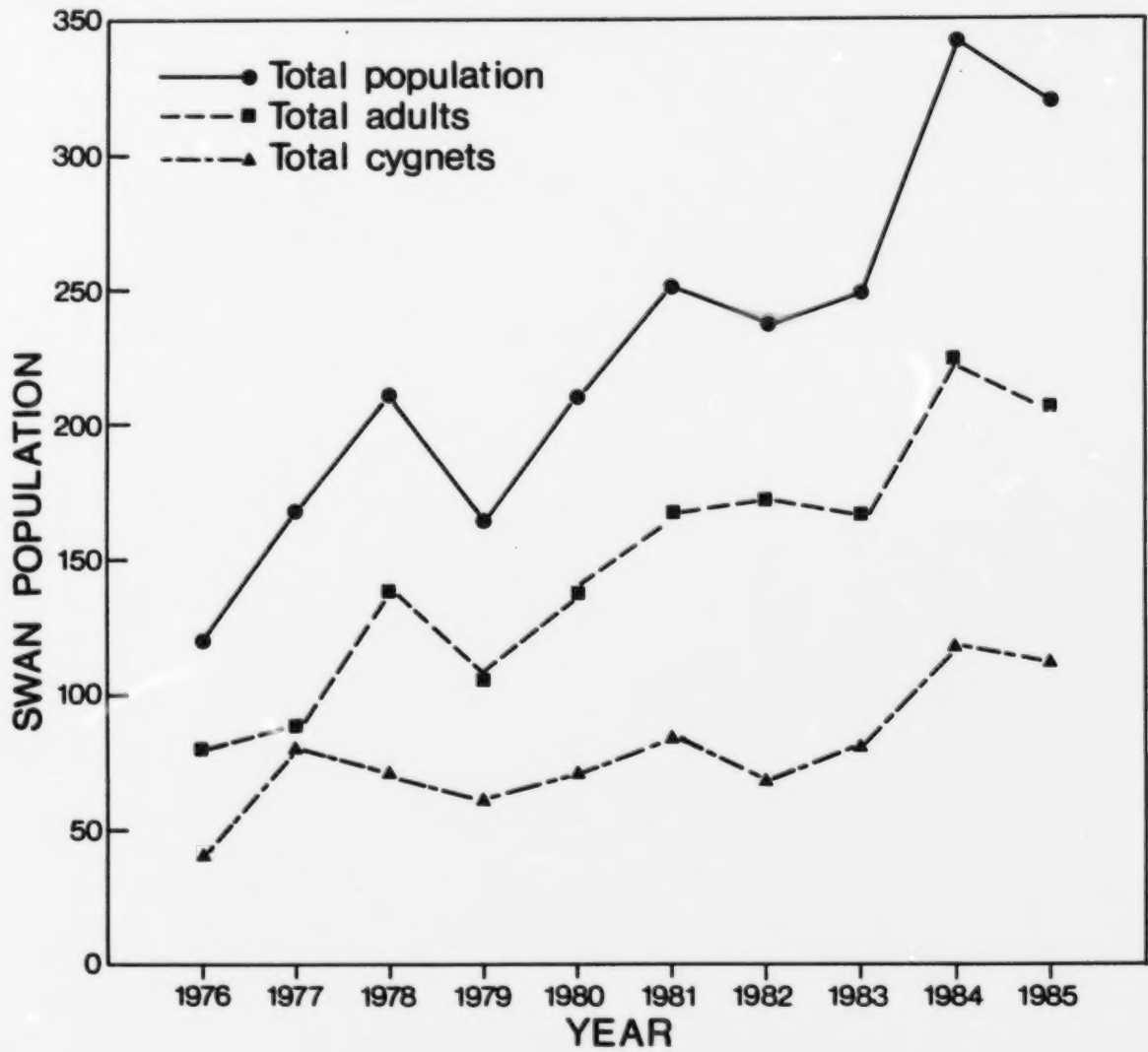


Figure 3. Temporal changes in Grande Prairie trumpeter swan flock.

3.8, indicates a productive population which may still continue to increase in the future (Fig. 3).

Within the Alberta portion of the Grande Prairie survey, a total of 51 pairs, 26 broods (98 cygnets) and 85 flocked or singles were recorded. A total of 283 trumpeter swans were observed. Although more wetlands (65) were surveyed during 1985 than in 1984, this larger sample of wetlands only accounted for an additional two pairs and one cygnet. These observations indicate a significant decrease in the 1985 Alberta population from 1984.

3.2 Alberta Pioneer Flocks

3.2.1 Otter/Russell Lakes - Chinchaga River

Two pairs with one and two cygnets respectively were observed on September 17 in the Otter Lakes area. In addition, a group of four adult swans were seen at Golden Lake (Appendix I). Specific locations of these observations and survey routes are found in Appendix I and II. These observations do not differ from September 21, 1982 when CWS biologists observed two pairs with six and four cygnets each in this same general area. In addition to a fairly extensive survey in this area, a site to the east known as the Panny Tower area was surveyed. A pair of swans were observed in this general area during the summer (G. Holton, pers. comm.), but no swans were observed during this survey. General impressions of the habitat in this area

indicate that the quality of wetlands is variable. Insufficient amount of good quality wetlands are lacking and thereby may be a factor limiting expansion of this flock.

On September 20, 1985 a survey of the Chinchaga River area was conducted (Appendix I). One pair with three cygnets was observed on S.E. Osland Lake, no other swans were seen during this survey. The number of swans in this area was much lower than expected, because 13 adults and eight cygnets were observed here during 1984 (G. Holton, pers. comm.).

3.2.2 Edson/Whitecourt

Six pairs of trumpeter swans were observed with two pairs having broods of two and four cygnets, respectively, during this survey. The route followed was the traditional route flown by the Alberta Fish and Wildlife and Canadian Wildlife Service (Appendix I). In addition, an area north of the town of Whitecourt was searched and a pair with two cygnets and a single white bird were observed. The results of the Edson portion of this survey do not differ significantly from results obtained by Taggart and Smith in 1984 or the CWS fall survey in 1983 when 12 and eight adult swans, respectively, were observed. A lack of quality wetlands may limit the expansion of the flock in this area.

3.2.3 Pincher Creek/Cardston and Cypress Hills, Saskatchewan

Three pairs of trumpeters were observed within Waterton Lake National Park during the August 29, 1985 survey. No cygnets were observed, although production of broods has been recorded in this area during previous years (J. Stelfox, pers. comm.). The survey route followed during this survey can be found in Appendix I. The quality of the trumpeter swan habitat was variable in this area.

The Cypress Hills area in Saskatchewan was not surveyed since it was determined that Saskatchewan Natural Resource personnel had conducted extensive ground surveys of the area. M. Killaby (pers. comm. 1985) indicated that one breeding pair which produced two cygnets and two single white birds were observed in this area in 1985 (Appendix I).

3.3 1985 Survey Area Population Estimate

The 1985 fall survey of the Grande Prairie flock and several pioneer flocks of trumpeter swans in Alberta-Saskatchewan has resulted in the documentation of 75 pairs, 92 grouped or singles and 130 cygnets. This accounted for 242 total adult and subadult birds and a population estimate of 372 trumpeter swans within the area surveyed.

4.0 RECOMMENDATIONS

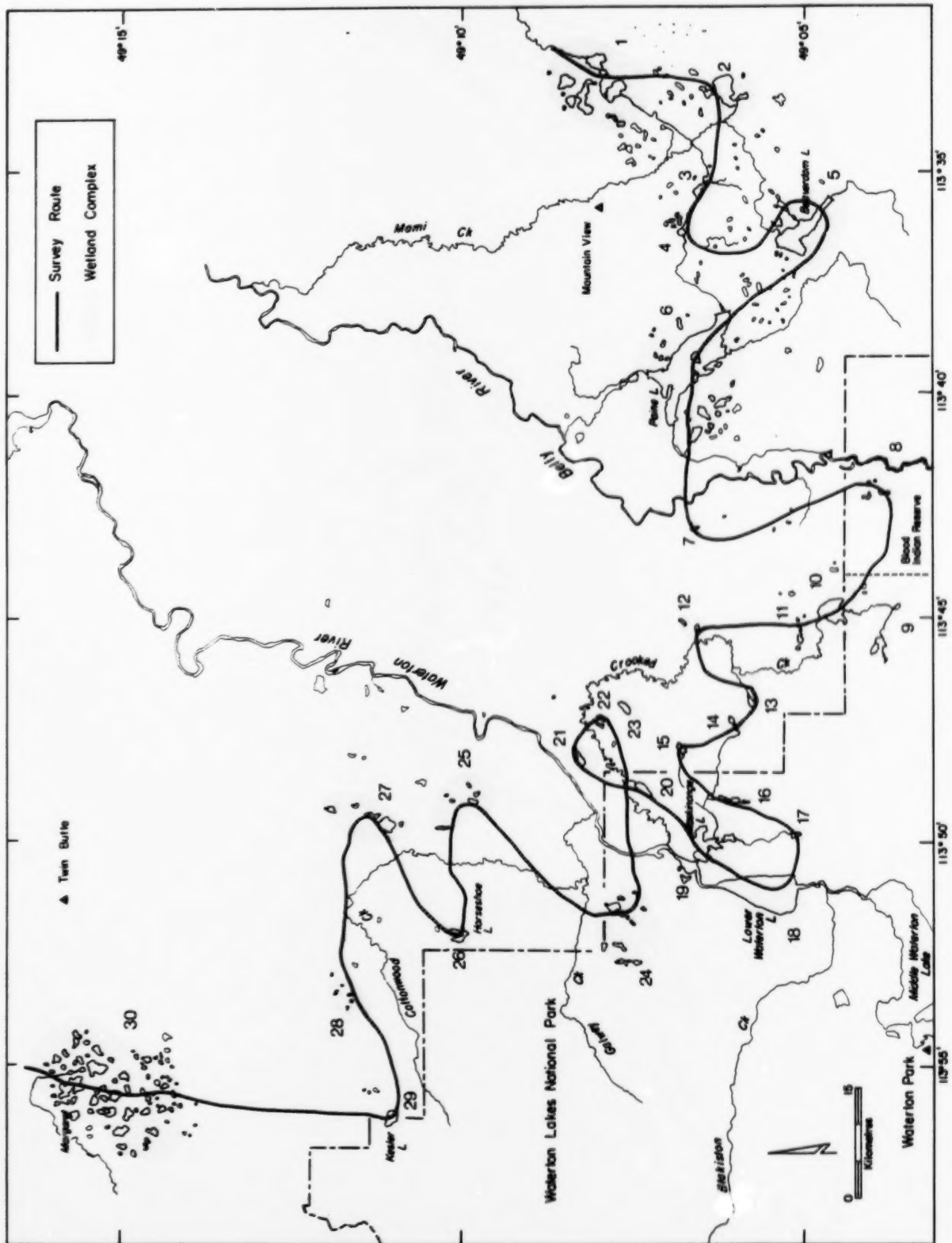
Considering the results of these surveys and management priorities for trumpeter swans, it is recommended that:

- 1) annual surveys to monitor status of the Grande Prairie flock, including the B.C. component be continued.
- 2) mid-summer surveys be initiated to better document breeding habitat use and carrying capacity for trumpeter swans within the current Canadian breeding range.
- 3) information on annual population status and habitat use be provided to local land management authorities to ensure continued protection of trumpeter swan habitat throughout the region; and
- 4) there is an immediate need to undertake a marking project, especially on pioneering swans, to improve our knowledge of wintering habitat use by Canadian breeding trumpeter swans.

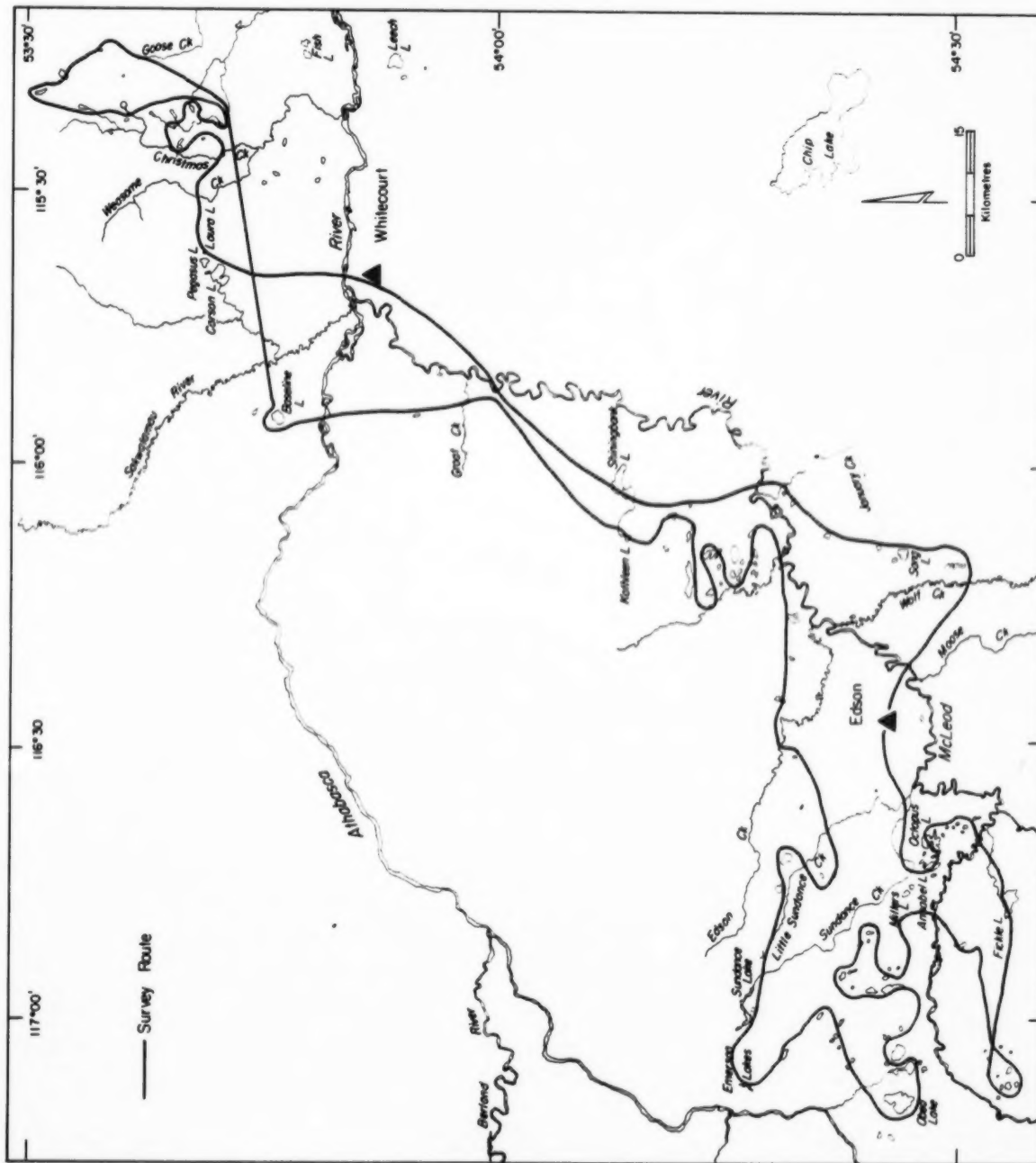
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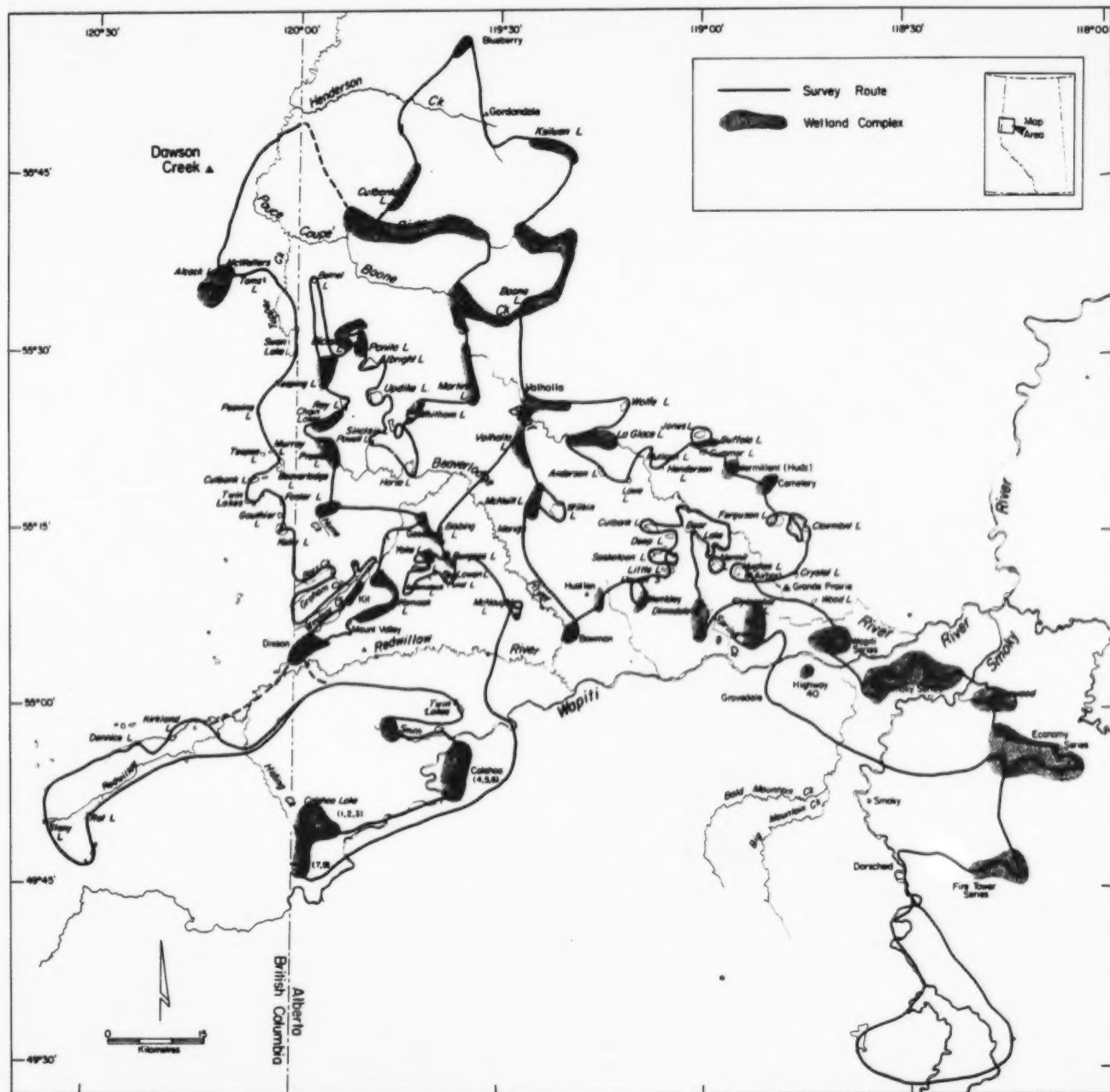
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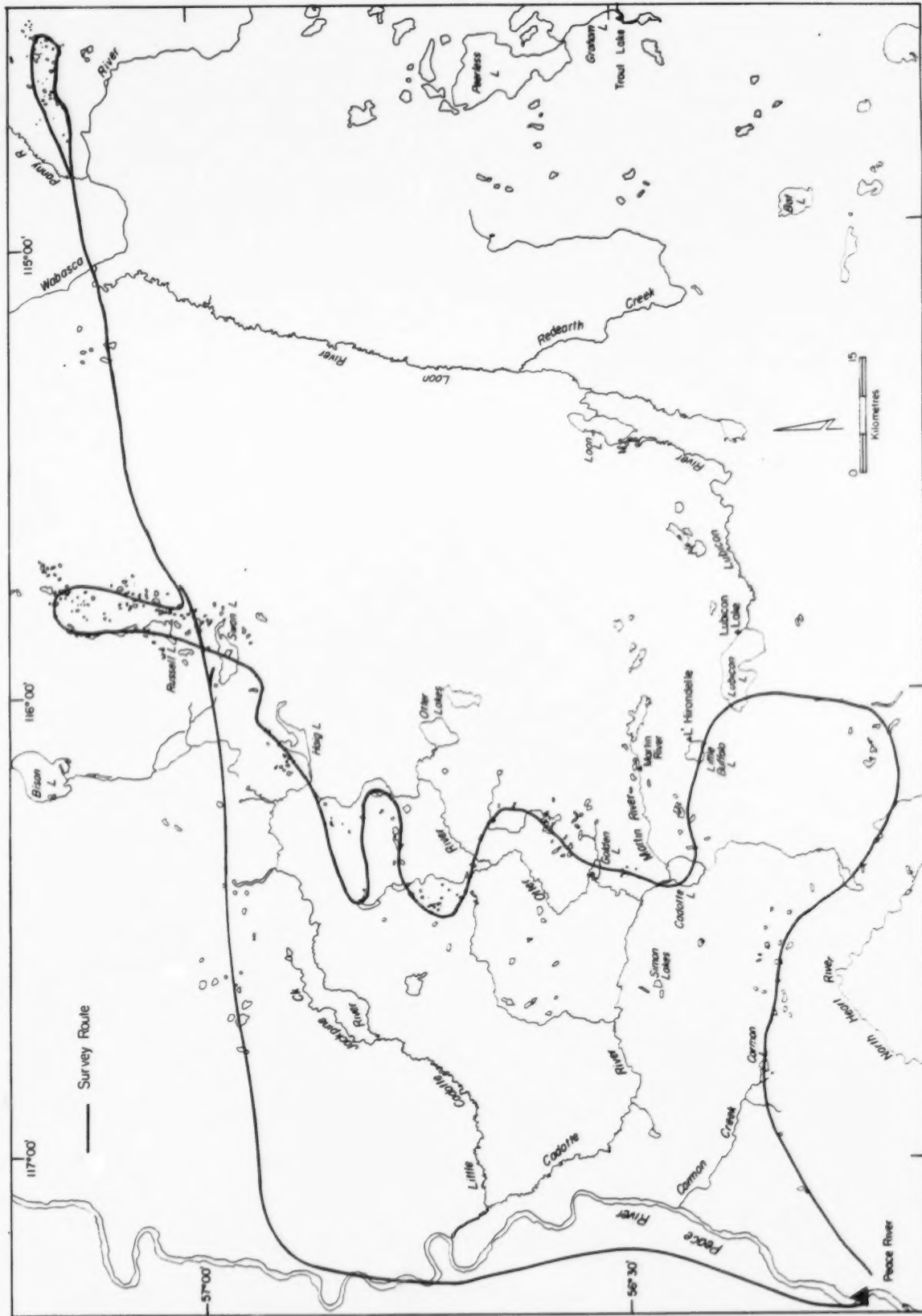
Appendix I. Cardston/Pincher Creek trumpeter swan 1985 survey route.



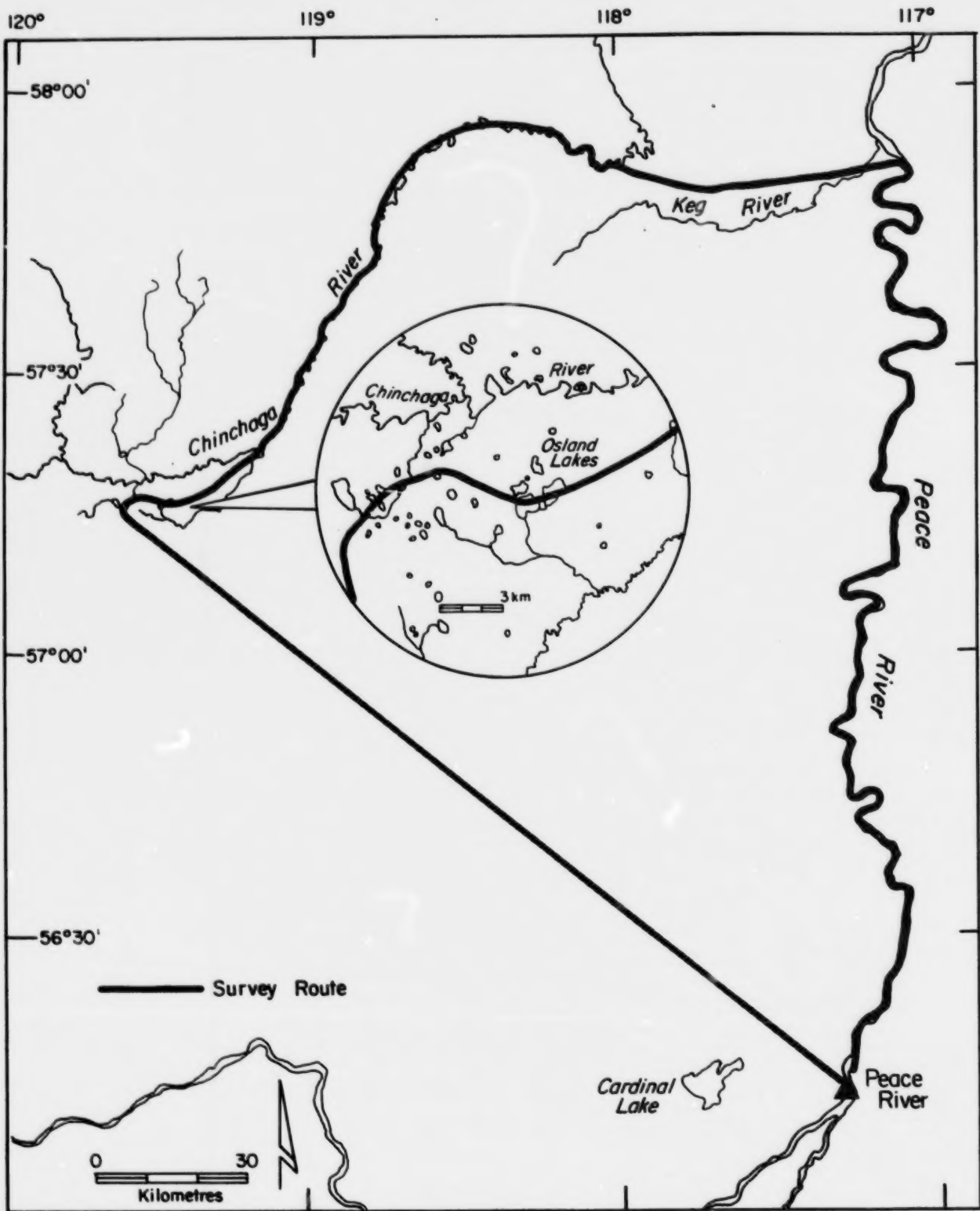
Appendix I. Edson/Whitecourt trumpeter swan 1985 survey route.



Appendix I. Grande Prairie trumpeter swan 1985 survey route.



Appendix I. Otter/Russell Lakes trumpeter swan 1985 survey route.



Appendix I. Chinchaga River trumpeter swan 1985 survey route.

Appendix II. Trumpeter swan aerial survey results, Alberta/British Columbia, fall 1985.

Wetland	UTM Grid	Map #	Pairs	Cygnets	Single	Group	Total
Unnamed, Waterton 1	TK 933 407	82H	1				2
Unnamed, Waterton 2	TK 933 405	82H	1				2
Unnamed, Waterton 3	TK 926 433	82H	1				2
Kathleen Lake	NK 558 668	83F	1				2
Unnamed, Edson 1	NK 562 661	83F	1	2			4
Unnamed, Edson 2	NK 554 654	83F	1				2
Unnamed, Edson 3	NK 518 643	83F	1				2
Unnamed, Edson 4	NK 516 633	83F	1				2
Sucker Lake	NK 504 634	83F	1	4			6
Unnamed, Whitecourt 1	PL 607 623	83K	1	2			4
Unnamed, Whitecourt 2	PL 606 618	83K			1		1
Osland Lake NW	LP 352 649	84E	1	3			5
Golden Lake	NN 538 667	84C				1	1
Unnamed, Otter Lake 1	NN 535 692	83C	1	2			4
Unnamed, Otter Lake 2	NN 536 694	84C	1	1			3
Albright	LM 323 649	83M	1				2
Anderson	LM 358 634	83M	1	5			7
Bear	LM 375 625	83M				4	39
Boone	LM 347 662	83M	1	4			6
Boone Creek (2)	LM 339 649	83M	1	4			6
N. Boone	LM 354 671	83M	1	3			5
E. Boone	LM 351 663	83M	1	6			8
W. Boone Creek	LM 336 661	83M	1		1		3
Burgess	LM 333 621	83M	1				2
SW Chain	LM 313 643	83M	1	5			7
Cutbank 2	LM 328 678	83M	1	3			5
Deep	LM 368 624	83M	1				2
Dickson	LM 319 656	83M	1	2			4
Dimsdale	LM 372 613	83M	1				2
Ellenwood	ML 419 607	83M		5	1		6
Ellenwood Creek	ML 417 607	83M	1	5			7
Flyingshot	LM 382 613	83M	1	2			4
Dixson-2	LM 314 612	83M	1				2
SE Goodfare	LM 334 622	83M	1				2
Henderson	LM 367 635	83M	1	6			8
Horse	LM 328 634	83M	1	7			9
Horse	LM 328 635	83M	1				2
Hume Creek	LM 314 629	83M	1	5			7
Intermittent (Hudz)	LM 378 635	83M	1	5			7
Kamisak	LM 324 615	83M	1				2
E. Kamisak	LM 326 616	83M	1	2			4
Keeping	LM 314 650	83M	1				2
N. Keeping	LM 314 653	83M	1				2

Appendix II. Continued.

Wetland	UTM Grid	Map #	Pairs	Cygnets	Single	Group	Total
La Glace	LM 358 640	83M			1	1	4
Little	LM 367 618	83M	1	4			6
Martin	LM 338 647	83M	1				2
N. McNaught's	LM 344 613	83M	1	4			6
McNeill	LM 347 629	83M				1	10
Mt. Valley	LM 318 612	83M	1	3			5
Ponita	LM 321 655	83M	1				2
N. Ponita	LM 321 657	83M	1				2
Pouce Coupe	LM 319 675	83M	1				2
Powell	LM 323 641	83M	1				2
Preston	LM 315 640	83M	1				2
Preston	LM 315 638	83M	1				2
Sinclair	LM 325 643	83M				1	27
S. Twin	LL 334 608	83M	1	5			7
Urdike	LM 323 648	83M	1	4			6
Valhalla	LM 345 638	83M	1				2
Wilkin	LM 351 628	83M	1				2
Wolfe	LM 362 646	83M				1	3
Wood	LM 390 613	83M	1	3			5
Yoke	LM 330 623	83M	1	3			5
SE Yoke	LM 332 622	83M	1				2
Calahoo Creek 2	LL 312 682	83L	1				2
Economy Creek 3	ML 422 689	83L	1	1			3
Dorscheid	ML 403 671	83L		1	1		2
Smoky River	LL 398 682	83L	1				2
Beaverlodge BC	FS 687 136	93P	1	5			7
Cutbank E BC	FS 687 132	94P	1				2
Foster BC	FS 687 132	93P	1				2
Gauthier BC	FS 687 129	93P	1				2
Swan BC	FS 689 155	93P	1				2
Teepee BC	FS 687 138	93P	1	4			6
Twin W BC	FS 683 131	93P	1	3			5
Kirkland BC	FR 673 673	93I	1	4			6
Stony Lake BC	FR 655 678	93I	1				2
Stony Marsh BC	FR 653 675	93I	1				2
Calahoo Creek 8	LL 308 674	83M	1				2
Kit 2	LM 319 618	83M		1	1		2
Smith 2	LL 324 695	83L	1				2
Smoky 7	MM 401 602	83M	1				2
Smoky 8	LM 699 601	83M	1				2
Smoky 14	MM 412 602	83M	1				2
Highway 40	LM 389 603	83M			1		1

